MECHANICAL ENGINEERING

The Journal of The American Society of Mechanical Engineers

INDEX TO VOLUME 54

January—December
1932

Published by
The American Society of Mechanical Engineers
29 West Thirty-ninth Street, New York

INDEX TO MECHANICAL ENGINEERING

Volume 54, January–December, 1932

(BR) denotes Book Review, (C) Correspondence, (Ed) Editorial

ABBOTT, E. J., FIRESTONE, F. A., AND DURBIN, F. M.
Reducing noise of machines 271

ACCIDENTS
Automobile, fully preventable (Ed) 498
Automobile, some primary causes of 505
Industrial, prevention of (BR) 87

AERIAL PHOTOGRAPHY
New film for (Krypto-cyanine) 848
View showing 7200 sq. mi. of earth's surface 818

AERODYNAMICS
Airfoils, inviscid flow past 862
Hydrodynamics and (BR) 231
Lift, increase of, devices for 513
Tail-surface flow in the spin 514

AERONAUTICS
See also Aerodynamics; Airplanes
Drag of small streamlined bodies, measurement of 285
Progress in 848
Spinning, safety in 50

AGRICULTURE
Applications of electricity in farming operations 873

AIRCRAFT
Light alloys in 50
Use in warfare (Ed) 281

AIR COMPRESSORS
British 427

AIR CONDITIONING
Arrangement of centrifugal refrigerating system and cycle of refrigerant 656
Labus psychrometric chart 428
Railway trains, application to 796

AIR CYLINDERS
Rotating, proposed standard for 226

AIR FLOW
See Flow of Air

AIR LIFT
Theory of 794

AIRPLANE CARRIERS
Landing and storing naval airplanes on decks of mother ships, problems involved in 389

AIRPLANE ENGINES
Crankshafts, vibration characteristics of 435
New fuel for 514

AIRPLANE PROPELLERS
Hollow steel 50
Stroboscopic study of 221

AIRPLANES
Clinogyre rotating-blade attachment for 862
Construction, use of beryllium alloys in 214
Diesel engines for 726
Flight tests with control column giving warning of dangerous wing loads 500
Gyroplane, Wilford 862
Monoplane, Kohl tailless 500
Seaplanes, high-speed 427
Wing sections, super-high-load 213

AIR PREHEATERS
Boiler plant with 141

AIRSHIPS
Design, application of practical hydrodynamics to 427
Metal-covered (C) 72

ALFORD, L. P., AND HANNUM, J. E.
Measuring operating performance by the kilo man-hour 821

ALLEN, OLIVER F.
U. S. Navy Diesel-engine requirements (C) 517

ALLNER, F. A.
Hydroelectric developments and the correlation of hydro and steam power 695

ALLOY STEELS
Dynamic strength and ductility of 133
Endurance properties in steam 51
Endurance properties, means of improving 133
Hardening by magnetic treatment 57
Notches, flaws, corrosion, etc., effect of 133

ALLOYS
Beryllium, use in aeronautic construction 214
Fusible, in metal forming 52
Fusible, physical properties of (table) 52
High-temperature use, properties of alloys for 113

ALLOYS (*continued*)
Iron-boron alloys and 18-8 steels with boron 574
Nickel 132
Thermal conductivities of (chart) 276

ALUMAWELD
Solder for aluminum 51

AMERICAN ENGINEERING COUNCIL
Progress report of its committee on the relation of consumption, production, and distribution 415

AMERICAN SOCIETY OF CIVIL ENGINEERS
Comment on its 80th birthday (Ed) 860

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Annual meeting, Dec. 5–9, 1932, program of 808
Boiler Code Committee. See Boiler Code Committee, Work of
Boiler Construction Code. See Boiler Code
Committee on economic status of engineers plans action 156
Fifty-second annual meeting 78
Lubrication research of 269
Organization, work of Calvin W. Rice in 5
Power test codes. See Power Test Codes
Presidential address of Roy V. Wright 20
Transactions papers, synopses of 65, 147, 223, 297, 439, 511, 583, 731, 799, 875

AMERICAN STANDARDS ASSOCIATION
Work in last quarter of 1931 71

AMMONIA
Evolution of, in carbonization of coal 430

AMMUNITION
Armor-piercing 490
Bullets. See Bullets
Tracer 491

ANGUS, ROBERT W.
Hydraulics of open channels (BR) 591

APPLIED MECHANICS
Progress in 846

APPRENTICE TRAINING
In times of depression (C) 226

ARKWRIGHT, RICHARD
His part in early days of the industrial revolution (with portrait) 677

ARMOUR INSTITUTE OF TECHNOLOGY
Development plan of 841

ASBESTOS
Yarns and cloths of 650

AUTOMOBILE ENGINES
Cast crankshafts and camshafts for 366
Design, improvements in 484

AUTOMOBILES
See also Motor Trucks
Accidents, some primary causes of 505
Accidents with, preventable (Ed) 498
Air wheels vs. standard tires 483
Brakes, centrifugally cast drums for 724
Cars of 1932, features of 230
Crankcase draining of 789
Design, trend of 483
Diesel-engined 575
Diesel engines for 726
Dual-power rear axle for 291
Gas for road vehicles 365
1932 national automobile show in New York, notes on 230
Operating-cost and mileage studies 59
Packard twin-six, carburetion of 292
Speeding, costs of 653
Stopping distances for various speeds 653
Streamline body designed by Sir Dennistoun Burney 484

AUTOMOTIVE FUELS
See Gasoline

AVIATION
Soviet Russia, data on 427

B

BAILEY, ALEX. D.
The economics of electrical power supply 557

BAILEY, NEIL P.
The measurement of surface temperatures 553

BALLISTICS
See Bullets

BANKING
Branch banking defined 829
Weak spots in system and proposed remedies 825

BANKS
Bank of England, Bank of France, and Bank for International Settlements, views of 826

BATTLESHIPS
U.S.S. "Salt Lake City," view of 388

BEAMS
I-beams, light, strength of 723

BEARCE, H. W.
Definition of the inch 689

BEARING METALS
Porous bronze 108

BEARINGS
Ball and roller, for sliding mechanisms 573
Bearing-temperature stresses, a possible criterion for 502
Journal, capillary lubrication of 108
Journal, overheating of, criterion for tendency toward 502
Lubrication of 434
Roll-neck, sleeve-type 364
Steel rings lined with lead bronze, tests on 294
Thin coatings of white metal deposited on mild-steel surfaces, atomization and fatigue of 294

BELTS
Action of gravity on (Lewis effect) 720
Endurance-testing machine for 438

BERGER, GEORGE G.
Economic lot sizes (C) 517

BERYLLIUM
Aeronautic construction, use in 214
Copper alloys for springs, use in 430
Production and applications (BR) 520

BIGELOW, CARLE M.
Management essentials for recovery 749

BINGHAM, EUGENE C.
Mechanics of plastic bodies (BR) 305

BLAST FURNACES
Magnetogorsk, Russia ..... (Ed) 355, 461

BLOWING ENGINES
Large, performance of 346

BOILER CODE
Boiler Construction Code, Revisions and Addenda to 299, 370

BOILER CODE COMMITTEE, WORK OF
Interpretation of cases 74, 153, 302, 441, 516, 660, 878

BOILER FEEDWATER
Priming, use of salts to reduce 59

BOILER FIRING
Dust and sulphur from powdered-coal firing 501

BOILER FURNACES
Heat transfer by radiation in 576
Large stations, recent practice in 638
Smoke from, steam-air jets for abating 267

BOILER PLANTS
First cost of steam-boiler plants 791
High-pressure, using brown coal 60

BOILERS
Benson marine boiler 138
Blast-furnace-gas-fired 868
Combination waste-heat and pulverized-fuel boiler unit 867
Combined rotary boiler and steam turbine 869
Critical-pressure 138
Drums, welded 222
Exhaust, on passenger steamships 789
Design factors affecting reliability and operation of boiler plants 506
High-pressure, for research work 251
Lancashire, modern installation of 141
Lancashire-type double boiler 729
Leakage, power test code for 77
Moderate-size, stokers for 791
Openings in cylindrical drums and shells, rule for determining (charts) 368
Priming, reduction of 59
Pulverized-coal-fired 216
Rotary type 853
Series operation of 729

BOILERS (*continued*)
Sludge as a source of danger in 576
Steam generator for tangential firing 216
Velox explosion type 506

BOOKS REVIEWED
America's answer to the Russian challenge. By Robert Sibley 231
Applied gyrodynamics—for students, engineers, and users of gyroscopic apparatus. By Ervin S. Ferry 737
Behemoth: the story of power. By Eric Hodgins and F. Alexander Magoun ... 447
Beryllium, its production and application 520
Dynamics of engine and shaft. By Ralph E. Root 883
Earthquake damage and earthquake insurance. By John R. Freeman 591
Economic control of quality of manufactured product. By W. A. Shewhart 664
Fundamentals of instrumentation 806
Handbook of business administration. By W. J. Donald 157
Hydraulics for engineers. By Robert W. Angus 447
Hydraulics of open channels. By Boris A. Bakhmeteff 591
Hydro- und aerodynamik (Handbuch der Experimental-physik vol. IV), edited by Prof. L. Schiller 231
Industrial accident prevention 87
Jobs, machines, and capitalism. By Arthur Dahlberg 317
Mechanical fabrics. By George B. Haven 807
Pathways back to prosperity. By Charles Whiting Baker 317
Plasticity: a mechanics of the plastic state of matter. By A. Nadai 305
Principles of organization as applied to business 87
Proceedings of the fifth oil-power conference 664
Quantity and economy in manufacture. By Fairfield E. Raymond 160
Raise wages! By A. G. McGregor 736
Sydney Harbour bridge 883
Tables of rolling pressures and power requirements for rolling steel shapes. By F. Waldorf 447
The paradox of plenty. By Harper Leech 317
The physics of high pressure. By P. W. Bridgman 159
The quest for power from prehistoric times to the present day. By Hugh P. Vowles and Margaret W. Vowles ... 159
The work, wealth, and happiness of mankind. By H. G. Wells 882
Wasserbauliche Modellversuche zur Klärung der Abflusserscheinungen beim Abschluss der Zuiderzee 520

BOOKS RECEIVED
Brief notes on new books received by the U. E. S. Library 88, 160, 233, 306, 377, 441, 521, 592, 665, 737, 807, 883

BORING MACHINES
Problems in design of 333

BORON
Alloys containing, properties of 574

BRAKES
Automobile, centrifugally cast drums for 724

BRASS
Rod, free-cutting, machinability of 285
Tubes, cold-drawn, bursting strengths of 219

BRIDGES
Bayonne, over Kill van Kull (view) 532
George Westinghouse bridge (view) 747
Sydney harbor bridge (BR) 883
Skew bascule bridge 650

BRILLHART, S. E.
The manufacture of rubber-covered wires for telephone installations 405

BRONZE
Be (beryllium-copper) 430
Porous 108

BRYANT, O. N.
Will economic stability suffice? (C) 879

BUILDING CONSTRUCTION
Graph showing cost trends in 474

BUILDINGS
Factory, taxable value of 473

BULLARD, J. E.
Danger of government ownership (C) ... 589
Invention, unemployment, and patent control (C) 303

BULLETS
Accuracy and range, developments in by Ordnance Dept., U. S. A 487
Markings on bullets and shells fired from small arms (C) 587
National match, trajectories of 490
U. S. caliber .30 ammunition, ballistic data for 489

BURGESS, GEORGE K.
The late, appreciation of (Ed) 566

BURLINGAME, LUTHER D.
Machine tools 323

BUSINESS
Conditions. See Economics
Cycles. See Economics.
Impotent (Ed) 280

C

CALORIMETERS
Saturated-steam, new, details of 119

CAMMEN, LEON
A chance for engineering progress 859
Power requirements in rolling steel (BR). 447
The saga of beryllium (BR) 520
The transportation dilemma 533
Will the boot straps stand the strain? (C) 734

CANADA
Hydroelectric development in (C) 805

CANNON
Cold working of 703
Design, fundamentals of 703

CARBON
Effect of ash on reactivity and combustibility of 431

CARBON DIOXIDE
Solid, in industrial refrigeration 577

CARBURIZING
Continuous gas process of 651

CARS, SUBWAY
Dimensions, weights, and equipment of New York City subway cars (table) ... 43
Improved, for New York's 8th Ave. subway 41

CASANOVA, ARRIGHI DE
Tribute to French power-plant engineer (Ed) 649

CAST IRON
"Migra" 215
Promal (new type of) 133
Remelted, tests of 215

CASTERS
Swivel type of 435

CASTINGS
Iron, permanent-mold 724

CEMENT
Low-heat, for mass concrete 863
Plants, grinding coal for use in 579
Portland-cement industry in U. S., Canada, and the United Kingdom, comparative study of 211

CENTRAL STATIONS
Brussels station, fire in 868
Performance data of certain American stations (table) 636
Practice in large modern American plants 635
View of turbine room of Hell Gate plant of United Electric Light and Power Co. 820
What does Pearl Street mean? (Ed) 718

CHEMICAL ENGINEERS
Earnings of (Ed) 209

CHIMNEYS
See Smokestacks

CHRISTIE, A. G.
Central-station plant and performance .. 635
Surplus power from industrial plants 771

CITIES
Changes in age structure and composition of urban populations 835

CITY PLANNING
Importance of human factor in 831

CLASSIFICATION
Scheme for use with natural phenomena . 805

CLAY
Measuring plasticity of 504

CLINOGYRES
Odier-Bessiere 862

CLOCKS
Slow-motion electric motor for 500

COAL
See also Pulverized Coal
Ammonia, evolution in carbonization and gasification of coal 430
Bituminous-coal industry, problems of (report of Pittsburgh conference) 85
Bituminous coal, oil, natural gas, and water power, contest between 256
Continuous carbonization of finely crushed coal by radiant heat 286
Dust, self-electrification of 52
Grinding mills for, tests in cement plants 579
Industry, troubles of 49
Solid, mechanism of combustion of 133

COAL-DUST ENGINES
See Internal-Combustion Engines

COCKS
Reduction in frictional resistance effected by changes in internal contour 476

COLUMNS
Reinforced-concrete, investigation of 57

COMPTON, KARL T.
Calvin Winsor Rice 5

COES, HAROLD V.
Current problems of industrial management (C) 661

COKE OVENS
Magnetogorsk, Russia 461

COLBY, Z. E.
Comments on August "Mechanical Engineering" (C) 804

COLVIN, FRED H.
Eight or Sixteen? (as base of measurement system) (C) 805

CONANT, WILLIAM S.
Research must go on! (C) 375

CONCRETE
Mass, low-heat cement for 863
Mixes, cement-water ratio for 51
Reinforced-concrete columns, investigation of 57

CONDENSATION
Pure vapors 563
Vapor-air mixtures 564

CONDENSERS
Recent practice in large stations 639

CONDUCTION
Heat, basic laws and data of 275

CONDUITS
Salt Springs-Tiger Creek (view) 676

CONVECTION
Film theory of 347
Forced, problems, analysis of 410, 412
Free, formulas for 347

COPPER
Industry, troubles of 49
Lake Balkhash copper works, Siberia ... 581

CORRESPONDENCE
Letters from readers 72, 154, 225, 303, 375, 443, 517, 587, 661, 733, 803, 879

CORROSION
Bonderizing process of preventing 568
Effect of oxygen on gaseous hydrogen sulphide corrosion of tank steel 429

COSMIC RAYS
Recent research in 846

COSTS
Break-even chart for use in analyzing ... 759
Mathematical analysis of 711

COWDRICK, EDWARD S.
What's ahead in foreman training? 629

COYLE, DAVID CUSHMAN
Public works and recovery 623

CRANES
Overhead, handling car trucks with 45

CREAM SEPARATORS
Noise rating of 273

CUNNINGHAM, JAMES D.
The Armour Institute development plan. 841

CUPOLAS
Blast for, effect of excessive atmosphere moisture in 215

CURRENT MECHANICAL ENGINEERING LITERATURE
Selected items from Engineering Index 89, 161, 234, 307, 379, 451, 523, 595, 667, 739, 811, 889

CUTTING METALS
See Metals

CUTTING TOOLS
Handbooks for users of, proposed series of (Ed) 861
Metal cutting, experiments in 137
New cutting materials, properties and limitations of 329
Roughing tool for lathe, standard 710
Skiving tools for formed parts 435
Standard tests for 708
Tool-mark patterns resulting from various machining and hand-tool operations, photomicrographs of 343
Tungsten carbide 137
Tungsten carbide tips with tantalum binder 365
Widia (tungsten-carbide) 137

CYLINDERS
Metal, thick-walled, cold working of 703

D

DAMS
A.S.C.E. request for data on 565

DAVIS, A. F.
A 732-mile pipe line (C) 225, 805

DAVIS, HARVEY N.
An appeal for constructive thinking 685
Other current steam research 126

DAVIS, RALPH C.
Current problems of industrial management (C) 661

DEALE, ROBERT C.
Standard tests for metal-cutting tools ... 708

DE LEEUW, A. L.
The newer cutting-tool materials 329

DEN HARTOG, J. P.
Applied gyrodynamics (BR) 737

DEPRESSION
See Economics.

DIE CASTING
High-pressure die castings 651
Up-flow vs. level-flow machines for (C) 73, 304

DIEDERICHS, H.
Fundamentals of instrumentation (BR) .. 806

DIES
Forging, "typing" process of making 579

DIESEL ENGINES
Claus 504
Cooling, closed system for 216
Cylinder-liner wear 726
Drives, a new idea in (Ed) 425
Exhaust-gas temperatures in 287
Fowler cavity-piston engine 433
Guiberson 502
High-speed direct-injection type for motor cars and airplanes 726
High-speed, effect of reducing ignition lag in 289
High-speed, future 112
High-speed, injection, ignition, and combustion in 288
High-speed, metering and injection in ... 652
Lanova 287
Marine, high-speed 863
Piston cracks, causes of 570
Pistons, new designs of 571
Rupa coal-dust engine 433
Turbo-charging of 433
U. S. Navy requirements (C) 517

DIFFERENTIAL EQUATIONS
Analyzer for solving 57

DIVIDING ENGINES
Darling's device for compensating errors in screws of 324

DONALDSON, CYRIL
Public works and recovery (C) 881

DONHAM, W. B.
Twenty-year plans as related to the temporary emergency 9

DRILLING MACHINES
Automatic, with hydraulically operated indexing table 480

DURAND, WILLIAM F.
The Zuider Zee reclamation project (BR) 520

DURBIN, F. M., ABBOTT, E. J., AND FIRESTONE, F. A.
Reducing noise of machines 271

DUST PRECIPITATION
Dust and sulphur from powdered-coal firing 501

E

EARNINGS
Chemical-engineering graduates (Ed) 209

EATON, HERBERT N.
The national hydraulic laboratory ... 263, 335

ECONOMICS
See also Industrial Management; Production; Steel Industry
Banking structure, present, strengthening of 825
Business cycle, industrial efficiency in ... 186
Business cycle, nature of 255
Business cycle, ways of damping swings in 623
Business executives, not engineers, to blame for conditions 613
Cities, problems arising from growth of .. 831
Consumption, production, and distribution, relation between 415
Credit control vs., overinvestment 775
Depression, cause of 173
Depression, current, apparent causes of 417
Depression, current, inadequate explanations of 415
Depression, current, suggested action for correction of 419
Depression, machinery industry during .. 181
Depression, recovery from, management essentials for 749

ECONOMICS (*continued*)
Distribution, need of development of technique for 750
Distribution, rising cost of (Ed) 209
Dumping, problem of 763
Economic analysis, constructive (Ed) 424
Economic forces, balancing of ..... 415, 519, (C) 588
Machine production, economics of ... 605, (C) 879
Education for industry in times of depression (C) 226
Engineers and (C) 803
Existing disorder, surveys of 317
For engineers (Ed) 425
Government ownership, danger of (C) ... 589
Ground rent, relation to employment (C) 663
Group discussion advocated (C) 519
Groups for discussion of 498
Housing, industrial, in Russia (Ed) 424
Industrial efficiency and economic equilibrium 185
Industry, economic attitudes in (Ed) 281
Kmh system, bearing on present industrial situation 821
Living conditions at Magnetogorsk 462
Machinery, challenge presented by 675
Machinery, influence on society 683
Marketing, product design as related to . 543
National interest, proposed determination of (Ed) 354
New construction, can it restore prosperity? 837
Operating expenses, control of 711
Preparing for a new day (Ed) 746
Problems of, constructive thinking on ... 685
Proposed 40-hr week in Great Britain ... 865
Prosperity, planning for 539
Public works and recovery (C) 881
Public works and the business cycle 623
Public-works plans for times of depression 687, 753
Purchasing power, question of 254
Russian challenge, America's answer to (BR) 231
Silk prices, unsuccessful attempt at control of 625
Stability, economic, will it suffice? (C) .. 879
Stability, plan to promote (C) 588
Stabilization, economic aspects of 23
State socialism, Russia's experiment in .. 469
Stevens engineering camp, study at conference at (Ed) 567
Taxable value of manufacturing properties 473
Transportation dilemma 533
Transmutation of lead into gold, effect of (Ed) 355
Twenty-year plans as related to the temporary emergency 9
Unbalance, methods of remedying through industrial policy 610
Wanted: industrial speed control (C) ... 376
Work, wealth, and happiness of mankind (BR) 882

EDISON, THOMAS A.
Edison and Faraday (C) 225
Significance of Pearl Street station (Ed) 718

EDITORIALS 48, 130, 208, 280, 354, 424, 498, 566, 648, 718, 784, 860

EDUCATION
See also Vocational Training
Apprentice training in times of depression (C) 226
Armour Institute development plan 841
Character required (Ed) 280
College alumni in "Who's Who in Engineering" by years of graduation (chart) 700
Engineering colleges, definite obligations of 842
Engineering colleges, product of 700
Engineering, developments in 857
Engineering, interest in, taking practical form (Ed) 861
Engineering, present tendencies endorsed (Ed) 208
Engineering, problems raised by recent occupational surveys 541
Engineers and English (Ed) 130
English for engineering students (Ed) ... 424
Foreman training, status and future outlook of 629
Graduates of colleges and universities listed in "Who's Who in Engineering" (table) 701
Graduates of 16 engineering educational institutions of similar type, data on ... 701
Neglect of, danger in (Ed) 280
S.P.E.E. summer school in economics for engineers (Ed) 425
Summer engineering camp of Stevens Institute (Ed) 354
U. S. Naval Academy, increasing cultural content of curriculum (Ed) 719

ELASTICITY
Plasticity and (C) 443

ELDER, ROBERT F.
Product design for the market 543

ELECTRIC CURRENTS
Mercury-jet commutation of 214

ELECTRIC DRIVE
Textile mills converted to 221

ELECTRIC "EYE"
Use in inspection of surfaces for minute defects 647

ELECTRIC MOTORS
Slow-motion motor for clockwork 500

ELECTRIC POWER
Fuels used in U. S. in production of, 1919–1928 102

ELECTRICAL INSULATING MATERIALS
Thermal conductivities of (table) 278

ELECTRICITY
Farming applications of 873
Mechanical aspects of 8

EMPLOYMENT
Finding work for engineers 208
Increase through public collection of ground rent (C) 663

ENERGY
Transmission at resonance, efficiency of .. 500

ENGINEER REGISTRATION LAWS
New York State, amendments to 446
New York's registration law (Ed) 424
Present status 320

ENGINEERING
Applications of statistical method in manufacturing 778
Men and (Ed) 208
Pioneering in 146
Progress in, a chance for 859
Psychology and 30
Social investment, well-being, and 254

ENGINEERING EDUCATION
See Education

ENGINEERING FOUNDATION
Progress of its alloys of iron research 590

ENGINEERING INDEX
Selected items from 89, 161, 235, 307, 379, 451, 523, 595, 667, 739, 811, 885

ENGINEERING SOCIETIES LIBRARY
Increased use of (Ed) 208

ENGINEERING STANDARDIZATION
Notes on 71, 152

ENGINEERS
American, experiences at Magnetogorsk, Russia 463
Chemical, earnings of (Ed) 209
Civic service, activities in (Ed) 424
Council for professional development of, proposed program 633
Depression, involvement in 173
Economic conference at Stevens engineering camp (Ed) 567
Economics and (C) 803
Economics for (Ed) 425
Engineers advisory committee of the R.F.C. 785
Engineers and English (Ed) 130
Finding work for (Ed) 208
Economics, growing interest in 857
Government, aid rendered by engineers to 857
License law, New York State, amendments to 446
Licensing, raising qualifications for (Ed) . 784
Militant, need for 20
Problems confronting 245
Professional development of, council for (Ed) 567, 633
Professional development, progress in ... 856
Professional development ("what next?"), program for (Ed) 131
Registration laws for 320
Registration of (Ed) 131
Unemployment of (Ed) 566
Unemployment relief for 856

ENGINEERS' COUNCIL FOR PROFESSIONAL DEVELOPMENT
Comment on organization of (Ed) 648

ENGLISH
For engineering students (Ed) 424

EVAPORATION
Process of 127

EVERETT, H. A.
U. S. Navy Diesel-engine requirements (C) 517

F

FABRICS
Mechanical (BR) 807

FAIG, JOHN T.
Education for industry in times of depression (C) 226

FANS
Propeller-type ... 359

FARADAY, MICHAEL
Edison and (C) ... 225

FARMS
Electrification of ... 873

FERRIS, JOHN P.
Research for industrial pioneering ... 249

FERRIS, J. P., AND WIEDMANN, E.
Progress in the use of hydraulic equipment on production machinery ... 477

FERRYBOATS
Diesel-engined ... 56

FIELD, CROSBY
Principles of organization as applied to business (BR) ... 87

FIREBRICK
Action of coal-ash slags on, investigation of ... 431
Action of slags on (C) ... 154

FIRESTONE, F. A., DURBIN, F. M., AND ABBOTT, E. J.
Reducing noise of machines ... 271

FIRESTONE, F. A., AND VINCENT, H. B.
Inspection of surfaces for minute defects 647

FITCH, JOHN
Biographical sketch of ... 399

FLANDERS, RALPH E.
Credit control versus overinvestment ... 775
Engineering, investment, and social well-being ... 254
"Required reading" (BR) ... 317
The economics of machine production ... 605

FLIGHT
Spinning, safety in ... 50

FLOW OF AIR
Across a single wire or rope (chart) ... 413
Through circular orifices in thin plates ... 720
Warm, flow of, methods of making visible 874

FLOW OF FLUIDS
Band method for making visible flow of warm air ... 874
In pipes, pressure drop in ... 411
Inviscid flow, graphic solutions for ... 862
Streamline flow ... 412
Turbulent flow ... 412

FLOW OF LIQUIDS
Heating data for liquids in streamline flow (chart) ... 413

FLOW OF WATER
Heat-transfer coefficients for water flowing in ¾-in. tube (chart) ... 414
Measurement with grid-constricted orifice 286
Pipes, solutions of special problems by graphical analysis ... 866

FLOWERS, A. E., AND HERSEY, M. D.
Lubrication research of the A.S.M.E. ... 269

FORD, LOUIS R.
U. S. Navy Diesel-engine requirements (C) ... 518

FOREMAN TRAINING
Development and varieties of ... 629

FORESTATION
Effect of diminishing water supply on (Ed) ... 785

FORGES
Old Ryerson forge, near Bloomingdale, N. J. (view) ... 688

FORGING
Die forging ... 285
Typing process of making dies for ... 579

FORGING MACHINES
Cold-swaging ... 367

FREEMAN, JOHN RIPLEY
Obituary ... 781

FREIGHT CARS
For granular commodities ... 367

FRITSCHE, CARL B.
Metal-covered airships (C) ... 73

FUELS
See also Coal; Natural Gas; Pulverized Coal
Colloidal, for marine service ... 652
Competition between, factors determining 259
Continuous carbonization of finely crushed coal by radiant heat ... 286
Gaseous, advantages over bituminous coal ... 260
Gaseous and liquid, tangential firing of ... 216
Natural-gas fuel for power ... 362
Progress in ... 849
Solid, mechanism of combustion of ... 133

FULTON, A. C.
Climb milling ... 692

FURNACES
Melting, rotary pulverized-fuel fired, working of ... 725

FUSIBLE ALLOYS
See Alloys

G

GAGES
Limit, project for tolerances for ... 735

GAS
Measurement in metric system ... 221

GAS ENGINES
Centenary of pioneer inventor, Otto ... 556

GAS POWER
Progress in ... 852

GAS TURBINES
The internal-combustion turbine ... 570

GASES
Emissivities of various ... 494
Free convection in, data on ... 350
Smokestack, motion of ... 507
Thermal conductivities at 32 F (table) ... 296

GASOLINE
Leuna (German), composition of ... 361
Pipe-line transportation of ... 104
Viscosity of ... 568

GEARS
Differential planetary ... 364
New module system for ... 54
Planetary, with two driving members ... 364
Teeth of, accuracy in (Ed) ... 498
Worm gear, Walker-Holroyd, test of ... 290

GENEVA STOP
Inverse ... 217

GIESL-GIESLINGEN, A.
The transportation dilemma (C) ... 880

GILLETT, H. W.
Extreme-temperature metals ... 113

GOETHE, VON, JOHANN WOLFGANG
Portrait ... 387

GOVERNMENT OWNERSHIP
Danger of (C) ... 589

GUNS
See Cannon.

GUNTHER, CHARLES O.
Markings on bullets and shells fired from small arms ... 341, (C) 588

GYROPLANES
Wilford ... 862

H

HANNUM, J. E., AND ALFORD, L. P.
Measuring operating performance by the kilo man-hour ... 821

HARDENING
Metals, Herbert magnetic process for ... 57

HARWOOD, E. C.
Can new construction restore prosperity? 837

HAVEN, WILLIAM A.
Magnetogorsk ... 461

HAYNES, JAMES L.
The balancing of economic forces (C) ... 519

HEAT
Conduction of ... 275
Convection of ... 347, 410
Emissive power of a body ... 492
Fundamentals of ... 191
Melting-point determination by micro-pyrometer ... 435
Radiation in boiler furnaces ... 576
Radiation of ... 492
Surface temperatures, measurement of ... 553

HEAT-INSULATING MATERIALS
Low-temperature, conductivities of (table) 277

HEAT PUMPS
Variable-performance, batch heating with 63

HEAT TRANSFER
Across free surface of liquid ... 562
Coefficients for air flowing across pipes or rods (chart) ... 426
Coefficients for water flowing in ¾-in. tube (chart) ... 414
Mean temperature-difference calculation 411
Pressure drop and heat transfer in ... 506

HEAT TRANSMISSION
Basic laws and data of ... 190, 275, 347, 410, 492, 560
Coefficients of (table) ... 194
Evaporation and condensation ... 560
Heat transfer and surface friction for laminar flow, relation between ... 222

HEATING
Heat output of concealed radiators at various temperatures ... 432
Water heating by refrigerator ... 63

HEAVY-OIL ENGINES
See Diesel Engines

HERSEY, M. D., AND FLOWERS, A. E.
Lubrication research of the A.S.M.E. ... 269

HIGHWAYS
Elevated motor highways, New York, New Jersey, and Italy ... 536

HIRSHFELD, C. F.
Engineers' council for professional development ... 633
Whose fault? ... 173

HOGG, T. H.
Hydroelectric development in Canada ... 547

HOLLEY, ALEXANDER LYMAN
Portrait of ... 602

HOOVER, HERBERT CLARK
Portrait by Philip A. de Laszlo ... 170

HOVEY, OTIS E.
Sydney harbor bridge (BR) ... 883

HOXIE, GEORGE L.
Public works during times of depression 753

HUBBARD, CLYDE W.
Hydraulics for engineers (BR) ... 447

HUTCHINSON, FREDERICK LANE
Editorial tribute to ... 280
Portrait ... 243

HYDRAULIC DRIVES
Advantages for machine tools ... 477

HYDRAULIC EQUIPMENT
Use on production machinery ... 477

HYDRAULIC LABORATORIES
European (views of) ... 265
National, at Washington, D. C. ... 263, 335

HYDRAULIC MOTORS
Rotary, for machine tools ... 478

HYDRAULIC TURBINES
Installations in Canadian hydroelectric plants ... 550
New British type ... 363
Type, selection of ... 696

HYDRAULICS
Hydraulics for engineers (BR) ... 447

HYDROCARBONS
Catalytic pressure hydrogenation of ... 360

HYDRODYNAMICS
Hydrodynamics and aerodynamics (BR) ... 231

HYDROELECTRIC DEVELOPMENTS
Canada (C) ... 805
Canada, status in ... 547
Canadian, data on recently built plants ... 550
Hydro and steam power in, correlation of 695
Hydro storage for ... 698
Slave Falls development, Winnipeg River, aerial view of ... 547

I

ILLIUM
A metal for instruments ... 429

INDUSTRIAL MANAGEMENT
Business administration (BR) ... 157
Current problems of ... 467, (C) 661
Economic characteristics of the manufacturing industries ... 759
Economic production quantities, formula for ... 205
Management essentials for recovery from depression ... 749
Measuring operating performance by the kilo man-hour ... 821
Operating expenses, control of ... 711
Proposed forty-hour week in Great Britain 865
Quality and quantity in manufacture (BR) ... 160

INDUSTRIES
Experiences in 1921 compared with those of 1919 ... 182
Sick (Ed) ... 49

INDUSTRY
Economic attitudes in (Ed) ... 281
Idleness and, reproduction of engraving by Hogarth ... 674

INSPECTION
Engineering, radium in ... 580
Surfaces, minute defects in ... 647

INSTRUMENTATION
Fundamentals of (BR) ... 806

INTERNAL-COMBUSTION ENGINES
See also Airplane Engines; Automobile Engines; Diesel Engines; Gas Engines; Oil Engines; Gas Turbines
Coal-dust engine, possibility of ... 134
Compression-ignition engines, fuel-injection pumps for ... 54
Detonation in, determination of upper limit of duration of ... 865
Dynamics of engine and shaft (BR) ... 883
Jerk-pump injection system for compression-ignition engines ... 363
Rupa coal-dust engine, data on ... 135

INVENTION
Unemployment, patent control, and.....(C) 154, (C) 303, (C) 376
IRON
Manufacture, direct process of..... 291
Sponge, Wiberg process of making..... 789
IRON ALLOYS
Iron-boron, age-hardening properties of.. 574
Research on, progress in..... 590
IRON AND STEEL
Industry, progress in..... 850
IRON CASTINGS
High-quality, special iron for..... 215
IRON FOUNDING
Manufacture of centrifugally cast brake drums..... 724
Permanent-mold castings..... 724
ISLES, FREDERICK W.
Frictional resistance of cocks..... 476

J

JACOBUS, D. S.
Openings in cylindrical drums, rule for determining..... 368
JAPAN
Silk industry in, elements of..... 626
JEWETT, FRANK B.
Modern research organizations and the American patent system..... 394
Problems confronting the engineering profession..... 245
JORDAN, VIRGIL
The economic aspects of stabilization.... 23

K

KEENAN, J. H.
A steam chart for second-law analysis.... 195
KENNEDY, JULIAN
Tribute to American steel-works engineer (Ed)..... 649
KENT, ROBERT T.
Quantity and economy in manufacture (BR)..... 160
KENT, R. H.
The rôle of model experiments in projectile design..... 641
KEYES, F. G., AND SMITH, L. B.
Work (steam research) at Massachusetts Institute of Technology.....123, 125
KING, BERTELL W.
Invention, unemployment, and patent control (C)..... 154
KING, GEORGE I.
What is it all about? (C)..... 880
KING, W. J.
The basic laws and data of heat transmission.....190, 275, 347, 410, 492, 560
KINSMAN, RICHARD E.
Engineers and economics (C)..... 803
Work, wealth, and happiness of mankind (BR)..... 882
KITTREDGE, A. E.
A plan to promote economic stability (C) 588
KLEMIN, ALEXANDER
The Langley Field conference..... 513
KOEHLER, ARTHUR
Faith in research..... 755

L

LABORATORIES
Hydraulic. See Hydraulic Laboratories
University, use in guiding research..... 252
LARKIN, F. V.
Dreams come true (visit to Panama Canal)..... 115
LATHES
Automatic loader for group of..... 653
Bearings for machines using carbide tools 332
Cutting speeds and feeds for various depths of cut..... 709
Standard roughing tool for, proportions of..... 710
Tools, logical arrangement for..... 330
LEAD
Hard, physical properties of..... 52
LEAD OLEATE
Explosion hazard when used in lubricants 128
LIBRARY
See Engineering Societies Library
LINCOLN, J. C.
The economics of ground rent (C)..... 663
LIQUIDS
Boiling point and superheating..... 560
Evaporating, coefficients for (charts)..... 561
Evaporation and condensation..... 560
Free convection in.....350, 352
Thermal conductivities of various technically important liquids..... 279
LIVINGSTON, ROBERT TEVIOT
Control of operating expenses..... 711
LLOYD, M. G.
Industrial accident prevention (BR)..... 87
LOCOMOTIVES
Italian Diesel-engined..... 569
New 4-8-2 type of French manufacture.. 797
Semi-water-tube firebox developed by B. & O. R. R..... 796
Three-cylinder tank engines, Buenos Aires and Pacific Ry..... 141
LOOMS
John Kay's improved..... 680
Power, introduction by Cartwright..... 682
LUBRICANTS
Engine tests, relation to..... 502
Explosion and fire hazard of lead-oleate-oil compounds..... 128
Lead oleate mixed with light motor oil... 128
Physical characteristics of oils (table)... 573
Steam-turbine, physical characteristics of..... 573
Viscosity specifications, correct way to frame..... 502
Water in oil..... 572
LUBRICATION
Bearing lubrication..... 434
Bibliography on..... 270
Capillary bearing lubrication..... 108
Fifth oil-power conference, proceedings of (BR)..... 664
LUTEN, DANIEL B.
Invention, unemployment, and patent control (C)..... 376
LYNCH, REV. JOHN JOSEPH
Earthquake damage and earthquake insurance (BR)..... 591

M

MACHINE PARTS
Cams, use of helical-gear segments for... 727
Inverse Geneva wheel motion..... 217
Sliding mechanisms, ball and roller bearings of..... 573
Thrustors as control devices..... 503
MACHINERY
Challenge of..... 675
Control by thrustors..... 503
Influence on society..... 683
Noise reduction in..... 271
Stroboscopic investigation of actions of.. 221
Textile, taxable value of..... 475
Woodworking, possibilities in improvement of..... 758
MACHINES
Noise of, reducing..... 271
MACHINE-SHOP PRACTICE
Progress in..... 851
MACHINE TOOLS
See also Lathes; Milling Machines; Planers; Shapers
Accuracy, their functioning as factors in. 323
Adaptation to new jobs..... 364
British..... 290
British exports to Russia..... 574
Cold saw with hydraulic feed..... 481
Design as affected by new cutting-tool materials..... 329
Hydraulic drives, varieties successfully equipped with..... 480
Orders for, fluctuation with industrial production..... 181
Production, hydraulic equipment for.... 477
Shock and its avoidance in..... 334
Tooling determination, economics of.... 365
Vibration problems of..... 331
MAGNETOGORSK
Design and construction of mining and metallurgical plant for U.S.S.R..... 461
General panorama of site of..... 464
Map of U.S.S.R. showing location of.... 466
MAIN, CHARLES T.
The taxable value of manufacturing properties..... 473
MANUFACTURING
Economic lot sizes, formula for determining..... 205
Statistical method, application in..... 778
MANUFACTURING INDUSTRIES
Cost characteristics in..... 759
MANUFACTURING PROPERTIES
Taxable value of..... 473
MARBLE, EDWIN H.
Mechanical fabrics (BR)..... 807
MARINE ENGINEERING
Use of nickel and nickel alloys in..... 132
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Steam research at.....123–125
MATERIALS
See also names of specific materials
Demand for, artificial creation of (Ed).. 718
Developing uses for (Ed)..... 719
Industrial, thermal conductivities of various (table)..... 278
Strength of. See Strength of Materials
MATHEMATICS
Differential equations, machine for solving..... 56
MCCARTHY, R. H.
Industrial efficiency and economic equilibrium..... 185
MCKNIGHT, C. H.
Reducing material waste..... 109
MEASUREMENTS
Eight or sixteen (as base of system)? (C). 805
Inch, definition of..... 689
Linear, earliest precision machine for.... 325
Precision, machines for making..... 323
Standards for, surface and linear..... 324
U. S. inch, relation to British inch..... 691
"MECHANICAL ENGINEERING"
Comments from readers on (C).....734, 804
Editorial policy, statement of..... 818
Scope and purpose of..... 674
MECHANICAL ENGINEERING
Developments and trends in 1932..... 845
MECHANICAL ENGINEERS
Earnings data, proposed uses of..... 156
Economic status of, A.S.M.E. committee on, plans action..... 156
MECHANICAL TECHNOLOGY
Advances in 1932 in..... 848
MERCURY
Industry, status in 1931..... 429
MERRIAM, CARROLL F.
Hydroelectric development in Canada (C) 805
MESICK, B. S., JR.
The cold working of cannon..... 703
METALLIZATION
Employment as a protective process.... 658
Process, application to terra cotta..... 215
METALS
See also names of specific metals
Bright annealing with hydrocarbon gases 146
Cold working of thick-walled metal cylinders..... 703
Corrosion of, apparatus for studying.... 509
Creep stress, limiting, accelerated test for determination of..... 438
Cutting, experiments on and measurements of cutting force..... 137
Emissivities of various..... 494
Fusible. See Alloys
Hardening by magnetic treatment..... 57
High-temperature, properties of..... 113
High temperatures, use at..... 52
Illium—a metal for instruments..... 429
Melting points, investigation with micropyrometer..... 435
Oxyacetylene cutting of heavy plates, machine..... 144
Spraying..... 658
Strength at high temperatures..... 694
Temperature, effect on properties of.... 590
Thermal conductivities of certain technically important metals (table)..... 276
Transmutation of, economic effect of (Ed) 355
MICROPYROMETERS
Use for high-temperature melting-point investigations..... 435
MILLER, LIEUT. H. B.
The airplane carrier..... 389
MILLING
Climb method, advantages of..... 692
Multiple milling operations..... 327
Tungsten carbide milling cutters, determining value of..... 727
MILLING MACHINES
Thread, McLeod-Richards..... 55
Tungsten carbide cutters for..... 137
MITEREFF, S. D.
The balancing of economic forces (C)... 588
MODELS
Alloys for..... 52
MONEL METAL
Use in marine engineering..... 132
MOONEY, JAMES D.
Current problems of industrial management..... 467

MOORE, ALVIN EDWARD
Capillary bearing lubrication 108

MOTOR BUSES
Daimler double-deck bus 366

MOTOR CARS
See also Automobiles
Trend of design of 483

MOTOR TRUCKS
One-man "Sentinel" steam wagon 790
Ransome-Garrett transmission for 139

MUNRO, GEORGE W.
Wanted: industrial speed control (C) ... 376

N

NADAI, A.
Plasticity and elasticity (C) 444

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS
Results of recent investigations 513

NATURAL GAS
Competition with coal 101, 257
Consumption in 1930 (table) 101
Fuel for power, use as 362
Interstate movement of (chart) 102
Pipe lines in U. S., principal, map of 103
Production and interstate movement of (chart) 102
Transmission lines for, large-diameter ... 575
Trunk-line mileage July 1, 1929 (table) .. 103
Water vapor in 790

NICKEL
And its alloys, use in marine engineering 132
Pure, thermal conductivity of 277

NOISE
Characteristics, determination of 271
Machine, reduction of 271

NORTON, A. E.
Dynamics of engine and shaft (BR) 883

NUMBERS
Eight as basis for system of (C) 662

NUTS
Forging, machine for 63

O

OIL AND GAS POWER
Progress in 852

OIL ENGINES
Burmeister & Wain double-acting two-stroke 725
Combustion chamber, quiescent (C) 445
Combustion in, delay period in 569
Marine oil engine trials committee, report of 136

OIL INDUSTRY
Troubles of 49

OIL WELLS
Deep, temperature measurement of 52

OILS
Physical characteristics of (table) 573
Solubility in water, effect of temperature on (charts) 572
Water in, effect of 572

ORGANIZATION
A broad vision of (BR) 87

ORIFICES
Circular, in thin plates, flow of air through 720
Grid-constricted, for measuring flow of water 286

ORROK, GEO. A.
The quest for power from prehistoric times to the present day, by Hugh P. Vowles and Margaret W. Vowles (BR) 159

OSBORNE, NATHAN S., AND STIMSON, H. F.
Work (steam research) at U. S. Bureau of Standards 118

OTTO, NIKOLAUS AUGUST
Centenary of birth of 556

P

PACHIMETERS
Use in measuring shearing strength of plastic bodies 504

PANAMA CANAL
Visit to, description and views 115

PAPER INDUSTRY
Canadian, growth of 549

PAPER MILLS
Steam-cooling installations in 654

PARISH, WILLIAM F.
Lubrication engineering (BR) 664

PATENTS
American patent system as aid to modern research organizations 394
Foreign anticipation of American application 658
French patent granted to John Fitch (photograph) 401
Grant of priority in Patent Office as unemployment aid 146
Invention, unemployment, and patent control ..... (C) 154, (C) 302, (C) 376
Patent laws, significance of (Ed) 355
Permutit case, decision of U. S. Supreme Court in 145

PATTERNS
Casting, alloys for 52

PECK, C. B.
Will the boot straps stand the strain? (C) 733

PEGRAM, GEORGE B.
The physics of high pressure (BR) 159

PERRY, THOMAS D.
Plywood: a product of unusual possibilities 618

PETROLEUM
Pipe lines, interstate, mileage of 102

PFAU, ARNOLD
Invention, unemployment, and patent control (C) 303

PHOTOGRAPHY
Aerial; view showing 7200 sq. mi. of earth's surface 818

PHYSICS
Advances in 845
Mathematical, abstrusity of 650
Physics of high pressure (BR) 159

PIKE, ROBERT D.
The economic aspects of stabilization (C) 804

PILE DRIVING
Stress phenomena occurring in 786

PIPE
Metallic-arc method of manufacturing .. 139
Steel, flattening tests of electric-resistance-welded 140
Welded, manufacture of 579

PIPE LINES
See also Water Pipe Lines
A 732-mile pipe line (C) 225
Coal transportation in 53
Gasoline 104
Laying, cost of 59
Laying, engineering problems in 105
Natural-gas 575
Petroleum, interstate, mileage of (chart) 102
Pressure drop and heat transfer in, graphical method for determining 506
Pulverized coal, transmission by 568
Transportation by, economic and engineering problems of 101

PLANERS
Design of, problems in 334

PLANNING
Economic 9
Industrial, essentials of good plan 539

PLASTICITY
Measurement with pachimeter 504

PLATES
Circular, strength of 219

PLYWOOD
Advantages of 618

POLLISTER, EDWARD B.
U. S. Navy Diesel-engine requirements (C) 518

PORTLAND CEMENT
See Cement

POUND, J. H.
Pipe-line transportation 101

POWER
Behemoth: the story of power (BR) 447
Electric, economics of supply 557
Quest for (BR) 159
Solar, industrial possibilities of 866
Steam and hydro, correlation of 695
Steam; surplus, cost of 771
Test codes. See Power Test Codes

POWER GENERATION
Cost of (chart) 262
Progress in 852

POWER PLANTS
See also Central Stations
Binary-vapor plants 640
Boiler plants, recent data on (table) 636
Deepwater, N. J., turbo-generator at (view) 604
Fuel consumption by electric power plants, 1920–1932 (chart) 558
Hydro or steam, factors controlling choice of 697

POWER PLANTS (*continued*)
Investment in, unit, estimate of (table) .. 557
Investment per kw of generating capacity, 1920–1930, unit (chart) 559
Kilowatt-hours generated by fuels and by water power, 1920–1931 (chart) ... 558
Lancashire-boiler plant, modern 141
Mercury-vapor, comparative operating conditions of (table) 640
Operating costs, analysis of 715
Operating results in British central station 293

POWER TEST CODES
Head-measuring apparatus 443
Centrifugal compressors, exhausters, and fans, notes on 802
Instruments and apparatus 75, 802
Leakage measurement, preliminary draft of code on 75
Optical pyrometers and flue-gas analysis, notes on 802

POWER TRANSMISSION
Thyratrons in, possibilities of 366

PRENTICE, DONALD B.
The product of the engineering colleges .. 700

PRESSES
Extrusion, Krupp horizontal-type 578

PRESSURE VESSELS
Openings in cylindrical drums and shells, rule for determining (charts) 368

PRINTING
Books, Fiske's photo-reduction process of 141

PRODUCTION
Costs as related to plant capacity 759
Costs, mathematical analysis of 711
Industrial, fluctuation of, 1919–1931 (chart) 182
Lot sizes, economic (C) 517
Lot sizes, economic, formula for determining 205
Machine, economics of 605
Modern methods, unbalancing effects of. 605
Product design for the market 543
Quality and volume incompatible (Ed) .. 860
Quality, economic control of (BR) 664

PROJECTILES
Design of, rôle of model experiments in .. 641

PROMAL
A new type of cast iron 133

PROTECTIVE COATINGS
Sprayed metal as 658

PSYCHOLOGY
Engineering and 30

PUBLIC UTILITIES
Utilization of surplus power of industrial plants by 771

PUBLIC WORKS
Effectiveness as a stabilizing factor 623
New construction, can it restore prosperity? 837
Timed, as aid in recovery (C) 881
Timed public construction, fallacy of ... 145

PUBLICATIONS
Technical, saving time and money on (Ed) 499

PULVERIZED COAL
Combustion temperature of 134
Firing, removal of dust and sulphur in .. 501
Pipe-line transportation of 568
Transportation in pipe lines and cars 53

PUMPS
Air-lift, theory of 794
Centrifugal, operation costs of Diesel-driven units 577
Fuel-injection, for oil engines 54
Heat pumps 63
Oil, variable-displacement, for machine-tool-feed use 477
Rotary displacement pump, new type of. 60
Storm-water, large 432
Varley rotary pump 366

PUNCHING
Material waste in, reduction of 109

R

RADIATION
Between surfaces 495
Boiler furnaces, heat transfer by 576
Emission and absorption of metals, nonmetals, and flames and gases 493
Radiant energy, nature of 492
Solar 496
Solar, approximate absorptivity of various surfaces for (table) 496
Transmission of 495

RADIATORS
Concealed, heat output at various temperatures 432

RADIUM
Employment in engineering inspection.. 580

RAIL CARS
94-mph German car 436

RAILROAD MECHANICAL ENGINEERING
Progress in 854

RAILROADS
A century of (Ed) 861
Freight delivery, time required for 656
Gasoline-pipe-line competition with 104
Kofler automatic train stop 871
Trains, air conditioning of 796

"RAILWAY MECHANICAL ENGINEER"
Centennial of (Ed) 861

RAILWAYS
Bennie railplane, Scotland 535
Suspended, at Elberfeld, Germany (view) 534

RASTALL, W. H.
The machinery industry during depression 181

RAUTENSTRAUCH, WALTER
Handbook of business administration (BR) 157
Raise wages (BR) 736
The economic characteristics of the manufacturing industries 759

RECLAMATION
The Zuider Zee reclamation project (BR) 520

RECONSTRUCTION FINANCE CORPORATION
Engineering board of (Ed) 648
Engineers' committee aiding (Ed) 785

REFRIGERATING MACHINES
Pak-ice machine 220
Use for heating purposes 63

REFRIGERATION
Air conditioning, system for use in 657
Electric, by means of electrolysis 60
Industrial, solid carbon dioxide in 577
Vacuum system for maintaining water at low temperatures 656

RESEARCH
Engineering 249
Engineering progress through 859
Engineering, prompt, advantages of 859
Industrial-research laboratory, changes brought about by advent of 397
Invention and, difference between 756
Lubrication (of A.S.M.E.) 269
Patent system and modern research organizations 394
Progress of alloys of iron research 590
Steam, American and European 282, 356
Steam, properties of 118
Woodworking industries, field for in 756

RESONANCE
Efficiency of energy transmission at 500

RICE, CALVIN WINSOR
His work in professional-society organization 5
Honorary membership in A.S.M.E. conferred on 78
Portrait 4

RICHARDSON, EDWARD ADAMS
Comments on August "Mechanical Engineering" (C) 734

RICHARDSON, WM. H.
John Fitch: Patriot, martyr, pioneer steamboat inventor 399

RICKETTS, PALMER C.
Honorary membership in A.S.M.E. conferred on 78

RIEGELS, O. L.
The quiescent combustion chamber (C).. 445

RIVETED JOINTS
Joints subject to frequent changes of loading, tests on 728
Rivet holes, investigation of interior condition of 580

RIVETERS
Pneumatic squeeze type 657

RIVETING
Rivets in shipbuilding 864

ROBINSON, ERNEST L.
Group discussion of economic questions advocated (C) 519

ROCKETS
Interplanetary flight with 130

ROLLING MILLS
See also Steel Mills
Automatic straightening and coiling machine for cold-rolled strip 850
Blooming mill, 54-in., drive for 35
Continuous-sheet wide-strip mills 851
Illinois Steel Co., improvements at S. Chicago plant of 35
Plate mill, 96-in., finishing standard reducing gear drive for 37
Roll-neck bearings 364

RUBBER-INSULATED WIRES
Manufacture 405

RUSSIA
See also Magnetogorsk
Industrial housing in (Ed) 424
Magnetogorsk blast furnace in production (Ed) 355
Magnetogorsk metallurgical plant 459
State socialism in 469

S

SARRAF, E. M.
Action of slags on firebrick (C) 154

SAWS
Cold, with hydraulic feed 481

SAYLOR, W. C.
Invention, unemployment, and patent control (C) 303

SCIENCE
Problems it provides not insuperable (Ed) 648
Pure and applied, progress in 845
Social aspects of (Ed) 48
The community and (Ed) 48

SCREENS
Wire, types and their advantages 872

SCREW MACHINES
Automatic, magazine-feed attachment for 326

SCREW THREADS
Practice in U. S. A., survey of 659

SCREWS
Master, correcting device for producing. 324

SEAPLANES
High-speed 427

SEATRAIN
View showing method of loading 854

SEIBERT, CHARLES JAY
Principal or accessory to the crime? A reply to "Whose Fault?" 613

SEIDEWITZ, ERNST
Up-flow vs. level-flow die-casting machines (C) 74

SHAPERS
Design of, problems in 334
Rockford hydraulically operated 54

SHEET METAL
Punching, reduction of waste in 109

SHELLS
Markings on, when fired from small arms 341

SHEPARD, GEORGE H.
Planning for prosperity 539

SHIBUSAWA, VISCOUNT EI-ICHI
Obituary 229

SHIPBUILDING
Rivets in 864

SHIPS
American super-liners, design of 217
Automatic stabilization of 653

SIEVES
Fine-mesh, for testing 142

SILK
Unsuccessful attempt at price control of. 625

JOHN R. SLATTERY
Tribute to (Ed) 785

SMALL ARMS
Markings on bullets and shells when fired from 341

SMITH, ELLIOTT DUNLAP, AND WICKENDEN, WILLIAM E.
Engineers, managers, and engineering education 541

SMITH, L. B., AND KEYES, F. G.
Work (steam research) at Massachusetts Institute of Technology 123, 125

SMOKE
Abatement of 267
Density, measurement of 268

SMOKESTACKS
Motion of gases in 507

SOLDERS
Aluminum 51
Physical properties of 52

SOUNDMETERS
Type for use in factory inspection 272

SPANOGLE, JOHN A.
The quiescent combustion chamber (C). 446

SPRINGS
Wrought beryllium-copper for 430

STACKS
Large, erection of (view) 460

STABILIZATION
Economic aspects of ..... 23, (C) 804

STANDARDIZATION
Cast-iron soil pipe and fittings 877
Commodity specifications, directory of.. 801

STANDARDIZATION (*continued*)
Engineering, notes on 71, 152
Lantern slides 801
Screw threads, actual status in U. S. at present time 659
Standards yearbook (notice) 801
Tolerances for cylindrical parts and limit gages, project for 735

STANDARDS
Inch, U. S., present basis of 689
Proposed American tentative standard graphical symbols for electric traction, including railway signaling and electric power and wiring 515
Published, form and arrangement of 152
Rotating air cylinders and adapters 226

STATISTICAL METHOD
Applications in engineering and manufacturing 778

STEAM
See also Water (vapor)
Availability-entropy chart for 196
Availability increase, equation for 196
Condensation on a horizontal 3-in. tube, coefficients for (chart) 564
Coolers for 654
Evaporation process 127
Formation of 295
Heat of vaporization (chart) 356
Heat of vaporization, measurements of.. 119
High-pressure, apparatus for measuring heat content of 253
Leakage: boiler, piping, and engine (power test code) 75
M.I.T. *p-v-t* data, correlation of 125
Process and heating, economic generation of 292
Properties of, Callendar's work on 508
Properties of, Hausen's work on 847
Research, American and European.. 282, 356
Research at U. S. Bureau of Standards.. 118
Research, recent European 126
Research, progress in 118
Saturated, comparison of recent tables for 581
Superheated, conversion of ship to use of 503
Superheated, cooling of 653
Superheated, *p-v-t* measurements on (charts and tables) 123
Temperature-density curves for 283
Temperature in steam above a horizontal heating surface (chart) 561

STEAMBOATS
John Fitch's pioneer work on 399

STEAM CONDENSERS
Aluminum-brass tubes for 787

STEAM ENGINES
Crank effort, analytical study of 138
Drysdale high-speed 60
Dynamics of engine and shaft (BR) 883
For developing mechanical and electrical energy simultaneously 867
Leakage, power test code for 77
Mono-compound bleeder-type, tests of.. 62
Quadropod (quadruple-expansion) 658

STEAM PIPING
Leakage, power test code for 77

STEAM POWER
Water power vs., economics of 261

STEAM POWER PLANTS
See also Power Plants
Lancashire-type double-boiler installation 729
Power and process plants, allocating costs in 730
Resuperheating and extraction cycle 198
Reversible and irreversible cycles for 197
Series operation of boilers intended for utilization of energy of hot water 729
Steam-boiler plants, first cost of 791
Surplus power, utilization by utilities 771
Thermodynamic availability in, study of. 195

STEAMSHIPS
Combination turbine-reciprocator steam power plant for 504
Conversion of British S.S. "Cadillac" to superheating 503
Exhaust boilers on passenger liners 789

STEAM TURBINES
Blades, methods of improving efficiency of 437
Combined rotary boiler and steam turbines 869
Combination turbine-reciprocator power plant for steamship 504
Expansion lines of 293
Large 3000-rpm, tests of 793
Recent practice in large stations 638
Resuperheating and extraction cycle 199
Siemens-Röder 25,000-kw, tests of 793
Vibrations in wheels and blades, experimental investigation of 61

STEEL
See also Alloy Steels
Boron, properties of 575

STEEL (*continued*)
Characteristics of, inherent 501
Corrosion prevention by Bonderizing 568
Hardening by quenching in pectin solutions 436
High-strength, riveted joints of 728
Mild, fatigue of 359
Physical properties after plastic and yield-point extension 428
Rolling, power requirements in (BR) 447
Sensitivity or characteristic response to treatment 501
Structural, strength of light I-beams 723
Tank, corrosion of 429
Tool, "personality" or "timbre" of 429

STEEL INDUSTRY
Stabilization of (Ed) 499

STEEL MILLS
Modernizing 35

STERN, A. C.
Abating the smoke nuisance 267

STETSON, GEORGE A.
Behemoth: the story of power (BR) 447

STEWART, N. L.
Performance of a large blowing engine .. 346

STIMSON, H. F., AND OSBORNE, NATHAN S.
Work (steam research) at U. S. Bureau of Standards 118

STOKERS
Doby, for small and medium-sized boilers 791
Overfeed, operating characteristics of ... 140

STRENGTH OF MATERIALS
Brass tubes, cold-drawn, bursting strengths of 219
Circular plate, strength of sector between two radial ribs 219
Estimating, statistical methods in (Ed) .. 210
Light I-beams 723
Thin tubes, distortion under flexure 863
Wire rope, effects of bending 219

STROBORAMA
Stroboscopic device for studying machine movements 221

STUDLEY, G. L.
Economic lot sizes 205

SUBWAYS
Improved cars for 41

SULPHUR
Removal from gases in powdered-coal firing 501

SUN
See also Radiation (Solar)
Temperatures attained by various surfaces exposed to radiation from 496

SUPERHEATERS
Type used in converting ship to use of superheated steam 503

SUPERMISERS
Installation of 141

SURVEY OF ENGINEERING PROGRESS
..... 50, 132, 211, 282, 356, 427, 500, 568, 650, 720, 786, 862

SWASEY, AMBROSE
Celebration of 85th birthday 155
Portrait by Philip A. De Laszlo 99

SWEET, JOHN EDSON
Portrait of 603

SYMBOLS
Graphic, for electric traction and electric power and wiring 515

SYNOPSES OF A.S.M.E. PAPERS 65, 147, 223, 297, 439, 511, 583, 731, 799, 875

T

TANK CARS
Aluminum, development of 581

TANTALUM CARBIDE
Metal-cutting tools of 574
Metal removal with tools of 331

TAUBE, H. R.
Richard Arkwright and the early years of the industrial revolution 677

TECHNICAL SOCIETIES
Problems presented by 246

TELEPHONES
Rubber-covered wires for installations of, manufacture of 405

TEMPERATURES
Mean effective temperature difference (formula) 411
Surface, measurement of 553

TERRA COTTA
Metallized 214

TEXTILE INDUSTRY
Advent of inventor in 678

TEXTILE INDUSTRY (*continued*)
English, prior to industrial revolution ... 677
Progress in 855

TEXTILE MACHINERY
Taxable value of 475

TEXTILE MILLS
Conversion to electric drive 221

TEXTILES
Asbestos yarns and cloths 650

THERMODYNAMICS
See also Heat Transmission
Callendar's work on steam 508
Evaporation process, experiments on 294
Heat of vaporization of water at low temperatures 658
Second law, equation expressing law for fluid flow 195
Water vapor, new equation of state for ... 142

THERMOMETRY
Ice point, revised value of absolute temperature of 847

THOMSON, ELIHU
Faraday and Edison (C) 225

THORNDIKE, EDWARD L.
Psychology and engineering (Thurston lecture) 30

THRUSTORS
Uses as control devices 503

THURSTON LECTURE
Psychology and engineering, By E. L. Thorndike 30

THYRATRONS
Possibilities in power transmissioa 366

TINGLEY, E. M.
Eight as a basis for our system of numbers (C) 662

TOLTZ, MAX E. R.
Editorial note on demise 130
Obituary 228

TOUR, SAM
Up-flow vs. level-flow die-casting machines (C) 304

TOWNE LECTURE
Twenty-year plans, by W. B. Donham 9

TRACTORS
Caterpillar, hauling welding equipment with 107
Types used in South Africa 505

TRANSPORTATION
Biway moving-walk system of 509
Dilemma of (C) 880
Freight-delivery time 656
Interplanetary (Ed) 130
Pipe-line, economic and engineering problems of 161
Pipe-line, for pulverized coal 568
Rail, motor-truck, and bus transportation, coordination of ..... 533, (C) 733
"Seatrain" freight-car marine transport .. 855

TRUSCOTT, STARR
Hydro- und aerodynamik (Handbuch der experimental-physik, vol. IV) (BR) .. 231

TUBES
Brass, cold-drawn, bursting strengths of . 219
Manufacture, cold-swaging forging in ... 367
Steel, electric welding of seams 657
Thin, distortion under flexure 863

TUNGSTEN CARBIDE
See also Cutting Tools
Metal-cutting tools of 574
Metal removal with tools of 331

TURBINES
See Gas Turbines; Hydraulic Turbines; Steam Turbines

TURBO-ALTERNATORS
Development in cooling of 787

TURBO-BLOWERS
Largest in world, at Magnetogorsk (view) 463

TURNBULL, WILLIAM F.
A classification scheme for natural phenomena (C) 805

TYLOR, W. RUSSELL
Importance of the human factor in city planning 831

TYPE METAL
Physical properties of 52

U

UNEMPLOYMENT
An appeal for help (Ed) 784
Displaced worker in depression, problem of 188
Engineers, data on (Ed) 566
Invention, patent control, and ..... (C) 154, (C) 303, 376

UNEMPLOYMENT (*continued*)
Relief through granting priority to patents 146
Remedies for 9
Timed public construction no panacea for 145
Vocational training for the unemployed (Ed) 48

U. S. BUREAU OF STANDARDS
Steam research at 118

U. S. GOVERNMENT
Aid rendered by engineers 857
Proposed economies of (Ed) 354

U. S. NAVAL ACADEMY
Increasing cultural content of curriculum (Ed) 719

U. S. NAVY
Diesel-engine requirements (C) 517

V

VAN LEER, BLAKE R.
Engineer registration laws, their present status 320

VAPORS
Thermal conductivities of, at 32 F (table) 296

VIBRATION
Airplane-engine crankshafts 435
Steam-turbine wheels and blades 61

VINCENT, H. B., AND FIRESTONE, F. A.
Inspection of surfaces for minute defects. 647

VIVIAN, A. C.
Plasticity and elasticity (C) 443

VOCATIONAL TRAINING
Unemployment and (Ed) 48

W

WALL, WILLIAM G.
The trend of motor-car design 483

WALSH, JAMES L.
Strengthening our banking structure 825

WARSHIPS
See Airplane Carriers; Battleships

WASHINGTON, GEORGE
Portrait 386

WASTE
Material, reduction of 109

WATER
Availability-entropy chart for 196
Evaporation, experiments on process of .. 294
Heat of vaporization at low temperatures 658
Temperature-density curves for 283
Temperature in water above a horizontal heating surface (chart) 561
Thermal conductivity of 279
Thermal properties in region from 10 C to 500 C, and at saturation pressures up to 300 atm 295
Vapor, emissivity for various thicknesses and temperatures (chart) 495
Vapor, new equation of state for 142
Vapor, superheated, specific heat of (charts) 143
Viscosity of, investigation of 874

WATER HEATERS
Direct-contact, development of 788

WATER PIPE LINES
See also Cocks
Failure of mains 220
60-in. cast-iron water conduit at Atlantic City 59

WATER POWER
Steam power vs., economics of 261

WATER SUPPLY
Curtailment by maintenance of forests on watersheds (Ed) 785

WEART, S. A.
The economics of machine production (C) 879

WELDING
Boiler drums 222
Electric resistance welding of steel tubing 657
Metallic-arc process, use in pipe manufacture 139
Overhead and vertical, best procedure in . 510
Shielded-arc process (C) 225
Twin-spot-process 582
Welderies (shops for welding) 145

WELDING MACHINES
750-kva electric butt welder with hydraulic table drive 482

WELDS
Arc, nitrogen in 582
Corrosion of, device for studying 509
Defects in, method of testing for 509

WICKENDEN, WILLIAM E., AND SMITH, ELLIOTT DUNLAP
Engineers, managers, and engineering education 541
WIEDMANN, E., AND FERRIS, J. P.
Progress in the use of hydraulic equipment on production machinery 477
WILHELM, GLENN P.
Bullet development—accuracy and range 487
WILLIAMS, C. G.
Lead oleate-oil lubricants 128
Markings on bullets and shells fired from small arms (C) 587
WILSON, E. F.
Economic control of quality (BR) 664
WIRE
Bridge, cold-drawn, creep tests of 429
Galvanized, testing zinc coating on 438
Rubber-covered, for telephone installations, manufacture of 405
WIRE ROPE
Bending, effects of 219
Testing of 873
WOOD
Durability of 622
Preservation, methods used for 787
Substitutes for 622
WOODWORKING INDUSTRIES
Field for research in 757
Progress in 855
WOOL
New ideas in scouring, milling, shrinking, and finishing 797
WRIGHT, ROY V.
The engineer militant: presidential address at A.S.M.E. annual meeting 20

Y

YARROW, SIR ALFRED
Obituary 227